. . . connecting your business

# **LANCOM** L-1310acn dual Wireless

**Dual radio access point with internal antennas for Gigabit WLAN in modern enterprise environments**

- 1 x Gigabit WLAN based on IEEE 802.11ac (5 GHz) with up to 1,300 Mbps
- 1 x WLAN based on IEEE 802.11n (2,4 or 5 GHz) with up to 450 Mbps
- Parallel operation at 2.4 and 5 GHz as well as IEEE 802.11n/ac for heterogeneous client environments
- Support of 3x3-MIMO, 80 MHz WLAN channels, and 256-QAM
- Support of DFS channels of the 5 GHz frequency band
- Professional WLAN optimization with LANCOM Active Radio Control
- Client Steering for an intelligent distribution of clients to the best access point

LANCOM
Systems

The LANCOM L-1310acn dual Wireless accelerates Wireless LAN to Gigabit speed. Thanks to the support of the modern WLAN standard IEEE 802.11ac a gross data rate of up to 1,300 Mbps is achieved. With its two WLAN radio modules both 11n clients (via 2.4 GHz) and the increasing number of modern 11ac clients (via 5 GHz) can be provided with high-speed WLAN. On top of that, LANCOM access points with IEEE 802.11ac are fully backwards compatible to older WLAN standards as 802.11a/b/g/n. Thus the increasing demand for bandwidth of current clients can be fulfilled. On top of that, due to its elegant white housing and integrated antennas it is ideal for an inconspicuous application in modern environments.

**High-speed enterprise applications.**

With the rapid increase of mobile end devices in corporate environments and the habitually grown comfort of a wireless access, the demand for more bandwidth is growing as well. The LANCOM L-1310acn dual Wireless with the support of the new WLAN standard IEEE 802.11ac combines wireless freedom with the speed of wired networks. With a gross data rate of up to 1.3 Gbps the path is paved towards modern corporate applications with high demands for bandwidth. Applications with a high demand for bandwidth, so far only realizable via stationary cable networks, are now wireless and flexible due to the new WLAN standard. As a consequence, you can, for example, arrange telepresence applications location-independently without any loss of quality.

**More performance.**

In comparison to its predecessor IEEE 802.11n, the standard 802.11ac transmits exclusively at 5 GHz, with the benefit of more free, non-overlapping channels in contrast to the 2.4 GHz frequency band. Due to the wider 80 MHz radio channels and the more efficient modulation based on QAM-256, the resulting gross data rate per spatial stream is 433.3 Mbps. The LANCOM L-1310acn dual Wireless supports 3x3 MIMO and thus three spatial streams for an overall performance of 1,300 Mbps. This increase in speed is a big surplus especially for mobile clients such as tablet PCs or smart phones since the significantly shorter data transmission time leads to an increased battery lifetime.

**Better and reliable coverage.**

Keep in control over your wireless infrastructure! With the intelligent WLAN optimization concept LANCOM Active Radio Control (ARC) you sustainably optimize your radio field, proactively prevent sources of interference, and therefore use the full potential of your WLAN! As an example, the LANCOM L-1310acn dual Wireless supports Client Steering for an intelligent distribution of WLAN clients to the most ideal access point. As a consequence, the performance of your WLAN is significantly increased, especially in WLAN scenarios with a high number of end devices.

**More management.**

How much load is there on the network, what are the available data rates? How can you ensure that your well thought-out security policies are consistently implemented throughout the entire corporate network, even across different sites? LANCOM offers a variety of management options for networks of various sizes and in line with the customer's needs: Ranging from free, practical monitoring and configuration tools for very small networks to intelligent controller solutions that offer the cross-site monitoring and management of wireless networks. The L-13xx series offers the familiar LANCOM flexibility of management: Each access point can be operated in standalone mode and managed with the free administration tools, or it can be centrally managed by a LANCOM WLAN controller. Irrespective of whether the WLAN network is decentralized or centrally managed, a highly specialized monitoring solution is available with LANCOM LSM. This powerful monitoring and surveillance system for medium-sized and large networks is capable of monitoring up to 1,000 devices to give you secure control over your entire network infrastructure. For more information, visit www.lancom.de/en/lsm.

**More reliability for the future.**

LANCOM products are fundamentally designed for a product life spanning several years. They are equipped with hardware dimensioned for the future. Even reaching back to older product generations, updates to the LANCOM Operating System – LCOS – are available several times a year, free of charge and offering major features. LANCOM offers unbeatable protection of your investment!

# LANCOM L-1310acn dual Wireless

Features as of: LCOS 9.00

| WLAN | |
|---|---|
| Frequency band 2.4 GHz and 5 GHz | 2400 -2483.5 MHz (ISM) and 5150-5825 MHz (depending on country-specific restrictions) |
| Data rates IEEE 802.11n | Module 1: 1300 Mbps according to IEEE 802.11ac with MCS9 (Fallback to 6,5 Mbps with MCS0) |
| Data rates IEEE 802.11n | Module 2: 450 Mbps according to IEEE 802.11n with MCS23 (Fallback to 6,5 Mbps with MCS0) |
| Data rates IEEE 802.11b/g | Module 2: 54 Mbps to IEEE 802.11g (fallback to 48, 36 , 24, 18, 12, 9, 6 Mbps, Automatic Rate Selection) compatible to IEEE 802.11b (11, 5.5, 2, 1 Mbps, Automatic Rate Selection), IEEE 802.11 b/g compatibility mode or pure g or pure b |
| Data rates IEEE 802.11a/ h | Module 1 a. 2: 54 Mbps (fallback to 48, 36 , 24, 18, 12, 9, 6 Mbps, Automatic Rate Selection), fully compatible with TPC (adjustable power output) and DFS (automatic channel selection, radar detection) according to EN 301 893 |
| Output power at radio module, 5 GHz | Module 1: IEEE 802.11a/h: +18 dBm @ 6 up to 48 MBit/s and +16 dBm @ 54 MBit/s IEEE 802.11ac: +16 up to +18 dBm @ MCS0-7 20/40/80 MHz, +14 dBm @ MCS8 20/40/80 MHz, +14 dBm @ MCS9 40/80 MHz |
| Output power at radio module, 5 GHz | Module 2: IEEE 802.11a/h: +17 up to +18 dBm @ 6 up to 48 Mbps, +13 up to +15 dBm @ 54 Mbps IEEE 802.11n: +17 up to +18 dBm @ 6,5/13/19,5 Mbps (MCS0/8/16, 20 MHz), +11 up to +13 dBm @ 65/130/23 Mbps (MCS7/15/23, 20 MHz), +16 up to +17 dBm @ 15/30/45 Mbps (MCS0/8/16, 40 MHz), +9 up to +12 dBm @ 150/300/450 Mbps (MCS7/15/23, 40 MHz) |
| Output power at radio module, 2.4 GHz | Module 2: IEEE 802.11b: +22 dBm @ 1 and 2 Mbps, +22 dBm @ 5,5 and 11 Mbps IEEE 802.11g: +22 dBm @ 6 up to 36 Mbps, +20 dBm @ 48 Mbps, +18 dBm @ 54 Mbps IEEE 802.11n: +22 dBm @ 6,5/13/19,5 Mbps (MCS0/8/16, 20 MHz), +16 dBm @ 65/130/195 Mbps (MCS7/15/23, 20 MHz), +21 dBm @ 15/30/45 Mbps (MCS0/8/16, 40 MHz), +15 dBm @ 150/300/450 Mbps (MCS7/15/23, 40 MHz) |
| Minimum transmission power | Transmission power reduction in software in 1 dB steps to min. 0.5 dBm |
| Receiver sensitivity 5 GHz | Module 1: IEEE 802.11a/h: -95 dBm @ 6 MBit/s, -76 dBm @ 54MBit/s, IEEE 802.11ac: -94 dBm @ MCS0 20 MHz, -76 dBm @ MCS7 20 MHz, -72 dBm @ MCS8 20 MHz, -92 dBm @ MCS0 40 MHz, -76 dBm @ MCS7 40 MHz, -71 dBm @ MCS8 40 MHz, -70 dBm @ MCS9 40 MHz, -90 dBm @ MCS0 80 MHz, -72 dBm @ MCS7 80 MHz, -68 dBm @ MCS8 80 MHz, -67 dBm @ MCS9 80 MHz |
| Receiver sensitivity 5 GHz | Module 2: IEEE 802.11a/h: -93 dBm @ 6 Mbps, -79 up to -80 dBm @ 54 Mbps, IEEE 802.11n: -93 dBm @ 6,5 Mbps (MCS0, 20 MHz), -77 dBm @65 Mbps (MCS7, 20 MHz), -89 up to -90 dBm @ 15 Mbps (MCS0, 40 MHz), -69 up to -74 dBm @ 150 Mbps (MCS7, 40 MHz) |
| Receiver sensitivity 2.4 GHz | Module 2: IEEE 802.11b: -90 up to -91 dBm @ 11 Mbps, -101 dBm @ 1 Mbps, IEEE 802.11g: -94dBm @ 6 Mbps, -80 up to 81dBm @ 54 Mbps, IEEE 802.11n: -94 dBm @ 6,5 Mbps (MCS0, 20 MHz), -77 to -78 dBm @ 65 Mbps (MCS7, 20 MHz), -91 dBm @ 15 Mbps (MCS0, 40 MHz), -75 to -76 dBm @ 150 Mbps (MCS7, 40 MHz) |
| Radio channels 2.4 GHz | Up to 13 channels, max. 3 non-overlapping (depending on country-specific restrictions) |
| Radio channels 5 GHz | Up to 26 non-overlapping channels (available channels and further obligations such as automatic DFS dynamic channel selection depending on national regulations) |
| Roaming | Seamless handover between radio cells, IAPP support with optional restriction to an ARF context, IEEE 802.11d support |
| Opportunistic Key Caching** | Opportunistic key caching allows fast roaming processes between access points. WLAN installations utilizing a WLAN controller and IEEE 802.1X authentication cache the access keys of the clients and are transmitted by the WLAN controller to all mananged access points |
| Fast roaming* | Based on IEEE 802.11r, allows fast roaming procedures between access points. This is possible by using IEEE 802.1X authentication or pre-shared keys in controller based WLAN installations, which save the access keys temporarily and distribute them to the managed access points. |
| Concurrent WLAN clients | Up to 255 clients (recommended), 512 clients (max.)*** |
| Fast client roaming | With background scanning, moving LANCOM 'client mode' access points pre-authenticate to alternative access points which offer a better signal before Roaming fails |
| VLAN | VLAN ID definable per interface, WLAN SSID, point-to-point connection and routing context (4094 IDs) IEEE 802.1q |
| Dynamic VLAN assignment | Dynamic VLAN assignment for target user groups based on MAC addresses, BSSID or SSID by means of external RADIUS server. |
| Q-in-Q tagging | Support of layered IEEE 802.1q VLANs (double tagging) |
| Multi-SSID | Simultaneous use of up to 8 independent WLAN networks per WLAN interface |
| IGMP snooping | Support for Internet Group Management Protocol (IGMP) in the WLAN bridge for WLAN SSIDs and LAN interfaces for specific switching of multicast packets (devices with integrated WLAN only). Automated detection of multicast groups. Configurable action for multicast packets without registration. Configuration of static multicast group members per VLAN ID. Configuration of query simulation for multicast membership per VLAN ID |
| Protected Management Frames | Protection of WLAN Management Frames, based on the standard IEEE 802.11w, against man-in-the-middle attacks by using Message Ingegrity Codes (MIC) |
| Security | IEEE 802.11i / WPA2 with passphrase (WPA2-Personal) or IEEE 802.1X (WPA2-Enterprise) and hardware-accelerated AES, closed network, WEP64, WEP128, WEP152, user authentication, IEEE 802.1x /EAP, LEPS, WPA1/TKIP |
| EAP Types | EAP-TLS, EAP-TTLS/MSCHAPv2, PEAPv0/EAP-MSCHAPv2, PEAPv1/EAP-GTC, EAP-SIM, EAP-AKA, EAP-AKA Prime, EAP-FAST |
| RADIUS server | Integrated RADIUS server for MAC address list management |
| EAP server | Integrated EAP server for authentication of IEEE 802.1X clients via EAP-TLS, EAP-TTLS, PEAP, MSCHAP or MSCHAPv2 |

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Features as of: LCOS 9.00

| WLAN | |
|---|---|
| RADIUS Accounting per SSID | A RADIUS server can be set for each individual SSID |
| Quality of Service | Prioritization according to Wireless Multimedia Extensions (WME, subset of IEEE 802.11e) |
| U-APSD/WMM Power Save**** | Extension of power saving according to IEEE 802.11e by Unscheduled Automatic Power Save Delivery (equivalent to WMM Power Save). U-APSD supports the automatic switch of clients to a doze mode. Increasmed battery lifetime for telephone calls over VoWLAN (Voice over WLAN) |
| bandwidth limitation per WLAN client | Maximum transmit and receive bandwith and an individual VLAN ID can be assigned to each WLAN client (MAC address) |
| bandwidth limitation per SSID | Maximum transmit and receive bandwith can be assigned to each SSID |
| Broken link detection | If the link of a chosen LAN interface breaks down, a WLAN module can be deactivated to let the associated clients search for a new base station |
| Background scanning | Detection of rogue AP's and the channel information for all WLAN channels during normal AP operation. The Background Scan Time Interval defines the time slots in which an AP or Router searches for a foreign WLAN network in its vicinity. The time interval can be specified in either milliseconds, seconds, minutes, hours or days |
| Client detection | Rogue WLAN client detection based on probe requests |
| IEEE 802.1X supplicant | Authentication of an access point in WLAN client mode at another access point via IEEE 802.1X (EAP-TLS, EAP-TTLS and PEAP) |
| Layer-3 Tunneling | Layer-3 Tunneling in conformity with the CAPWAP standard allows the bridging of WLANs per SSID to a separate IP subnet. Layer-2 packets are encapsulated in Layer-3 tunnels and transported to a LANCOM WLAN controller. By doing this the access point is independent of the present infrastructure of the network. Possible applications are roaming without changing the IP address and compounding SSIDs without using VLANs. |
| IEEE 802.11u***** | The WLAN standard IEEE 802.11u (Hotspot 2.0) allows for a seamless transition from the cellular network into WLAN hotspots. Authentication methods using SIM card information, certificates or username and password, enable an automatic, encrypted login to WLAN hotspots - without the need to manually enter login credentials. |
| Note | The effective distances and transmission rates that can be achieved are depending of the site RF conditions |
| **) Note | Only in installations with WLAN controller |
| ***) Note | The 11ac WLAN module supports max. 128 clients, this specification refers to the combination with the 11n radio module. |
| ****) Note | Feature only available for IEEE 802.11n WLAN module. Feature for IEEE 802.11ac WLAN module in preparation. |
| **LANCOM Active Radio Control** | |
| Client Steering* | WLAN clients are directed actively to the best available access point to provide the best overall load balancing and the highest possible bandwidth for each client. Client Steering can be based on client number, frequency band, and signal strength. |
| Band Steering | Steering of WLAN clients towards the 5 GHz frequency band by restricting the access to the 2.4 GHz band. |
| RF Optimization* | Automatic selection of optimal WLAN channels. Due to reduced channel overlaps, WLAN clients benefit from an improved data throughput. In controller-based installations, an automatic selection of optimal channels is conducted for all managed access points. |
| Adaptive Noise Immunity | By using adaptive noise immunity an access point can cut out sources of interferences in the radio field and focusses on clients with a sufficent signal strength. Therefore, WLAN clients profit by having a higher data throughput available due to less interferences |
| Spectral Scan (WLAN-2 only) | By scanning the entire RF spectrum, interferences in the WLAN can be identified and graphically illustrated. Up to 13 channels (2.4 GHz) or up to 26 channels (5 GHz) (depending on national regulations and manual configuration). Illustration of signal strength on individual WLAN channels at a certain point of time |
| *) Note | Only in installations with WLAN controller |
| **IEEE 802.11ac/IEEE 802.11n Features** | |
| MIMO | MIMO technology is a technique which uses multiple transmitters to deliver multiple data streams via different spatial channels. Depending on the existing RF conditions the throughput is multiplied with MIMO technology. |
| 40 MHz Channels | Two adjacent 20 MHz channels are combined to create a single 40 MHz channel. Depending on the existing RF Conditions channel bonding doubles the throughput. |
| 80 MHz Channels | Four 20 MHz channels are combined to create a single 80 MHz channel. |
| 20/40MHz Coexistence Mechanisms in the 2.4GHz Band | Support of coexisting accesspoints with 20 and 40MHz channels in 2.4GHz band. |
| MAC Aggregation and Block Acknowledgement | MAC Aggregation increase the IEEE 802.11 MAC efficiency by combining MAC data frames and sending it out with a single header. The receiver acknowledges the combined MAC frame with a Block Acknowledgement. Depending on existing RF conditions, this technique improves throughput by up to 20%. |
| Space Time Block Coding (STBC) | Coding method according to IEEE 802.11n. The Space Time Block Coding improves reception by coding the data stream in blocks. |
| Low Density Parity Check (LDPC) | Low Density Parity Check (LDPC) is an error correcting method. IEEE 802.11n uses convolution coding (CC) as standard error correcting method, the usage of the more effective Low Density Parity Check (LDPC) is optional. |

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Features as of: LCOS 9.00

| IEEE 802.11ac/IEEE 802.11n Features | |
|---|---|
| Maximal Ratio Combining (MRC) | Maximal Ratio Combining (MRC) enables the receiver (access point), in combination with multiple antennas, to optimally combine MIMO signals to improve the client reception at long-range. |
| QAM-256 | Quadrature amplitude modulation providing 256 symbols or 8 bits per carrier |
| Short Guard Interval | The guard interval is the time between OFDM symbols in the air. IEEE 802.11n gives the option for a shorter 400 nsec guard interval compared to the legacy 800 nsec guard interval. Under ideal RF conditions this increases the throughput by upto 10% |
| **WLAN operating modes** | |
| WLAN access point | Infrastructure mode (autonomous operation or managed by LANCOM WLAN controller) |
| WLAN bridge* | Point-to-multipoint connection of up to 16 Ethernet LANs (mixed operation optional), broken link detection, blind mode, supports VLAN When configuring Pt-to-Pt links, pre-configured names can be used as an alternative to MAC Adresses for creating a link. Rapid spanning-tree protocol to support redundant routes in Ethernet networks |
| WLAN router | Use of the LAN connector for simultaneous DSL over LAN, IP router, NAT/Reverse NAT (IP masquerading) DHCP server, DHCP client, DHCP relay server, DNS server, PPPoE client (incl.Multi-PPPoE), PPTP client and server, NetBIOS proxy, DynDNS client, NTP, port mapping, policy-based routing based on routing tags, tagging based on firewall rules, dynamic routing with RIPv2, VRRP |
| WLAN client* | Transparent WLAN client mode for wireless Ethernet extensions, e.g. connecting PCs or printers by Ethernet; up to 64 MAC addresses. Automatic selection of a WLAN profile (max. 8) with individual access parameters depending on signal strength or priority |
| *) Note | Operating mode only available for IEEE 802.11n WLAN module. Operating mode for IEEE 802.11ac WLAN module in preparation. |
| **Firewall** | |
| Stateful inspection firewall | Incoming/Outgoing Traffic inspection based on connection information. Trigger for firewall rules depending on backup status, e.g. simplified rule sets for low-bandwidth backup lines. Limitation of the number of sessions per remote site (ID) |
| Packet filter | Check based on the header information of an IP packet (IP or MAC source/destination addresses; source/destination ports, DiffServ attribute); remote-site dependant, direction dependant, bandwidth dependant |
| Extended port forwarding | Network Address Translation (NAT) based on protocol and WAN address, i.e. to make internal webservers accessible from WAN |
| N:N IP address mapping | N:N IP address mapping for translation of IP addresses or entire networks |
| Tagging | The firewall marks packets with routing tags, e.g. for policy-based routing; Source routing tags for the creation of independent firewall rules for different ARF contexts |
| Actions | Forward, drop, reject, block sender address, close destination port, disconnect |
| Notification | Via e-mail, SYSLOG or SNMP trap |
| **Quality of Service** | |
| Traffic shaping | Dynamic bandwidth management with IP traffic shaping |
| Bandwidth reservation | Dynamic reservation of minimum and maximum bandwidths, totally or connection based, separate settings for send and receive directions. Setting relative bandwidth limits for QoS in percent |
| DiffServ/TOS | Priority queuing of packets based on DiffServ/TOS fields |
| Packet-size control | Automatic packet-size control by fragmentation or Path Maximum Transmission Unit (PMTU) adjustment |
| Layer 2/Layer 3 tagging | Automatic or fixed translation of layer-2 priority information (IEEE 802.11p-marked Ethernet frames) to layer-3 DiffServ attributes in routing mode. Translation from layer 3 to layer 2 with automatic recognition of IEEE 802.11p-support in the destination device |
| **Security** | |
| Intrusion Prevention | Monitoring and blocking of login attempts and port scans |
| IP spoofing | Source IP address check on all interfaces: only IP addresses belonging to the defined IP networks are allowed |
| Access control lists | Filtering of IP or MAC addresses and preset protocols for configuration access |
| Denial of Service protection | Protection from fragmentation errors and SYN flooding |
| General | Detailed settings for handling reassembly, PING, stealth mode and AUTH port |
| URL blocker | Filtering of unwanted URLs based on DNS hitlists and wildcard filters |
| Password protection | Password-protected configuration access can be set for each interface |
| Alerts | Alerts via e-mail, SNMP-Traps and SYSLOG |
| Authentication mechanisms | EAP-TLS, EAP-TTLS, PEAP, MS-CHAP, MS-CHAPv2 as EAP authentication mechanisms, PAP, CHAP, MS-CHAP and MS-CHAPv2 as PPP authentication mechanisms |

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Features as of: LCOS 9.00

| | |
|---|---|
| **Security** | |
| WLAN protocol filters | Limitation of the allowed transfer protocols, source and target addresses on the WLAN interface |
| Adjustable reset button | Adjustable reset button for 'ignore', 'boot-only' and 'reset-or-boot' |
| IP redirect | Fixed redirection of any packet received over the WLAN interface to a dedicated target address |
| **High availability / redundancy** | |
| VRRP | VRRP (Virtual Router Redundancy Protocol) for backup in case of failure of a device or remote station. Enables passive standby groups or reciprocal backup between multiple active devices including load balancing and user definable backup priorities |
| FirmSafe | For completely safe software upgrades thanks to two stored firmware versions, incl. test mode for firmware updates |
| Analog/GSM modem backup | Optional operation of an analog or GSM modem at the serial interface |
| Line monitoring | Line monitoring with LCP echo monitoring, up to 4 addresses for end-to-end monitoring with ICMP polling |
| **Routing functions** | |
| Router | IP and NetBIOS/IP multi-protocol router |
| Advanced Routing and Forwarding | Separate processing of 16 contexts due to virtualization of the routers. Mapping to VLANs and complete independent management and configuration of IP networks in the device, i.e. individual settings for DHCP, DNS, Firewalling, QoS, VLAN, Routing etc. Automatic learning of routing tags for ARF contexts from the routing table |
| HTTP | HTTP and HTTPS server for configuration by web interface |
| DNS | DNS client, DNS server, DNS relay, DNS proxy and dynamic DNS client |
| DHCP | DHCP client, DHCP relay and DHCP server with autodetection. Cluster of several LANCOM DHCP servers per context (ARF network) enables caching of all DNS assignments at each router. DHCP forwarding to multiple (redundant) DHCP servers |
| NetBIOS | NetBIOS/IP proxy |
| NTP | NTP client and SNTP server, automatic adjustment for daylight-saving time |
| Policy-based routing | Policy-based routing based on routing tags. Based on firewall rules, certain data types are marked for specific routing, e.g. to particular remote sites or lines |
| Dynamic routing | Dynamic routing with RIPv2. Learning and propagating routes; separate settings for LAN and WAN. Extended RIPv2 including HopCount, Output Delay, Poisoned Reverse, Triggered Update for LAN (acc. to RFC 2453) and WAN (acc. to RFC 2091) as well as filter options for propagation of routes. Definition of RIP sources with wildcards |
| DHCPv6 | DHCPv6 client, DHCPv6 server, DHCPv6 relay, stateless- and stateful mode, IPv6 address (IA_NA), prefix delegation (IA_PD), DHCPv6 reconfigure (server and client) |
| **Layer 2 functions** | |
| ARP lookup | Packets sent in response to LCOS service requests (e.g. for Telnet, SSH, SNTP, SMTP, HTTP(S), SNMP, etc.) via Ethernet can be routed directly to the requesting station (default) or to a target determined by ARP lookup |
| LLDP | Automatic discovery of network topology in layer 2 networks (Link Layer Discover Protocol) |
| DHCP option 82 | DHCP relay agent information (option 82) can be insterted on devices with WLAN bridge (RFC 3046) |
| IPv6 layer 2 protocol filter | Router advertisement snopping blocks illegal IPv6 router advertisements in the WLAN bridge. DHCPv6 snopping blocks all illegal DHCPv6 servers. The lightweight DHCPv6 relay agent (LDRA) can insert relay agent information on layer 2. |
| **COM port server** | |
| COM port forwarding | COM-port server for the DIN interface. For a serial device connected to it, the server manages its own virtual COM port via Telnet (RFC 2217) for remote maintenance (works with popular virtual COM-port drivers compliant with RFC 2217). Switchable newline conversion and alternative binary mode. TCP keepalive according to RFC 1122 with configurable keepalive interval, retransmission timeout and retries |
| **LAN protocols** | |
| IP | ARP, proxy ARP, BOOTP, DHCP, DNS, HTTP, HTTPS, IP, ICMP, NTP/SNTP, NetBIOS, PPPoE (server), RADIUS, RIP-1, RIP-2, RTP, SIP, SNMP, TCP, TFTP, UDP, VRRP, VLAN |
| Rapid Spanning Tree | IEEE 802.1d Spanning Tree and IEEE 802.1w Rapid Spanning Tree support for dynamic path selection with redundant layer 2 connections |
| IPv6 | NDP, stateless address autoconfiguration (SLAAC), stateful address autoconfiguration (with DHCPv6), router advertisements, ICMPv6, DHCPv6, DNS, HTTP, HTTPS, PPPoE, RADIUS, TCP, UDP, SMTP |
| **IPv6** | |
| Dual Stack | IPv4/IPv6 dual stack |
| IPv6 compatible LCOS applications | WEBconfig, HTTP, HTTPS, SSH, Telnet, DNS, TFTP, Firewall, RAS dial-in |

# LANCOM L-1310acn dual Wireless

Features as of: LCOS 9.00

| | |
|---|---|
| **WAN protocols** | |
| Ethernet | PPPoE, Multi-PPPoE, ML-PPP, PPTP (PAC or PNS), L2TPv2 (LAC or LNS) and IPoE (with or without DHCP), RIP-1, RIP-2, VLAN, IP |
| IPv6 | IPv6 over PPP (IPv6 and IPv4/IPv6 dual stack session), IPoE (autoconfiguration, DHCPv6 or static) |
| Tunneling protocols (IPv4/IPv6) | 6to4, 6in4, 6rd (static and via DHCP), Dual Stack Lite (IPv4 in IPv6 tunnel) |
| **WAN operating mode** | |
| xDSL (ext. modem) | ADSL1, ADSL2 or ADSL2+ with external ADSL2+ modem |
| **Interfaces** | |
| ETH1 (PoE) | 10/100/1000 Base-T, autosensing, auto node hub, PoE compliant with IEEE 802.3af/at. The port supports energy saving according to IEEE 802.3az |
| ETH2 | 10/100/1000 Base-T, default LAN port, configurable as WAN port. The port supports energy saving according to IEEE 802.3az |
| DSL over LAN (DSLoL) | One LAN port can (even parallel to LAN mode) be used as a WAN port for connecting external DSL modems (PPPoE) or external routers. |
| Serial interface | Serial configuration interface / COM port (8 pin Mini-DIN): 9,600 - 115,000 baud, suitable for optional connection of analog/GPRS modems. Supports internal COM port server and allows for transparent asynchronous transmission of serial data via TCP |
| Internal antennas per radio module | Radio module 1 and 2 use three internal antennas |
| **LCMS (LANCOM Management System)** | |
| LANconfig | Configuration program for Microsoft Windows, incl. convenient Setup Wizards. Optional group configuration, simultaneous remote configuration and management of multiple devices over IP connection (HTTPS, HTTP, SSH, TFTP). A tree view of the setting pages like in WEBconfig provides quick access to all settings in the configuration window. Password fields which optionally display the password in plain text and can generate complex passwords. Configuration program properties per project or user. Automatic storage of the current configuration before firmware updates. Exchange of configuration files between similar devices, e.g. for migrating existing configurations to new LANCOM products. Detection and display of the LANCOM managed switches. Extensive application help for LANconfig and parameter help for device configuration. LANCOM QuickFinder as search filter within LANconfig and device configurations that reduces the view to devices with matching properties. Central configuration of each management port. |
| LANmonitor | Monitoring application for Microsoft Windows for (remote) surveillance and logging of the status of LANCOM devices and connections, incl. PING diagnosis and TRACE with filters and save to file. Search function within TRACE tasks. Wizards for standard diagnostics. Export of diagnostic files for support purposes (including bootlog, sysinfo and device configuration without passwords). Graphic display of key values (marked with an icon in LANmonitor view) over time as well as table for minimum, maximum and average in a separate window, e. g. for Rx, Tx, CPU load, free memory. Monitoring of the LANCOM managed switches. Flick easily through different search results by LANCOM QuickFinder |
| WLANmonitor | Monitoring application for Microsoft Windows for the visualization and monitoring of LANCOM WLAN installations, incl. Rogue AP and Rogue Client visualization. LANCOM QuickFinder as search filter that reduces the view to devices with matching properties |
| Firewall GUI | Graphical user interface for configuring the object-oriented firewall in LANconfig: Tabular presentation with symbols for rapid understanding of objects, choice of symbols for objects, objects for actions/Quality of Service/remote sites/services, default objects for common scenarios, individual object definition (e.g. for user groups) |
| Automatic software update | Voluntary automatic updates for LCMS. Search online for LCOS updates for devices managed by LANconfig on the myLANCOM download server (myLANCOM account mandatory). Updates can be applied directly after the download or at a later time |
| **Management** | |
| WEBconfig | Integrated web server for the configuration of LANCOM devices via Internet browsers with HTTPS or HTTP. Similar to LANconfig with a system overview, SYSLOG and events display, symbols in the menu tree, quick access with side tabs. WEBconfig also features Wizards for basic configuration, security, Internet access, LAN-LAN coupling. Online help for parameters in LCOS menu tree |
| LANCOM Layer 2 Management (emergency management) | The LANCOM Layer 2 Management protocol (LL2M) enables an encrypted access between the command line interfaces of two LANCOM device directly via a Layer 2 connection |
| Alternative boot configuration | During rollout devices can be preset with project- or customer-specific settings. Up to two boot- and reset-persistent memory spaces can store customized configurations for customer-specific standard settings (memory space '1') or as a rollout configuration (memory space '2'). A further option is the storage of a persistent standard certificate for the authentication of connections during rollouts |
| Device SYSLOG | SYSLOG buffer in the RAM (size depending on device memory) to store events for diagnosis. Default set of rules for the event protocol in SYSLOG. The rules can be modified by the administrator. Display and saving of internal SYSLOG buffer (events) from LANCOM devices with LANmonitor, display only with WEBconfig |
| Access rights | Individual access and function rights for up to 16 administrators. Alternative access control on a per parameter basis with TACACS+ |
| User administration | RADIUS user administration for dial-in access (PPP/PPTP). Support for RADSEC (Secure RADIUS) providing secure communication with RADIUS servers |
| Remote maintenance | Remote configuration with Telnet/SSL, SSH (with password or public key), browser (HTTP/HTTPS), TFTP or SNMP, firmware upload via HTTP/HTTPS or TFTP |

# LANCOM L-1310acn dual Wireless

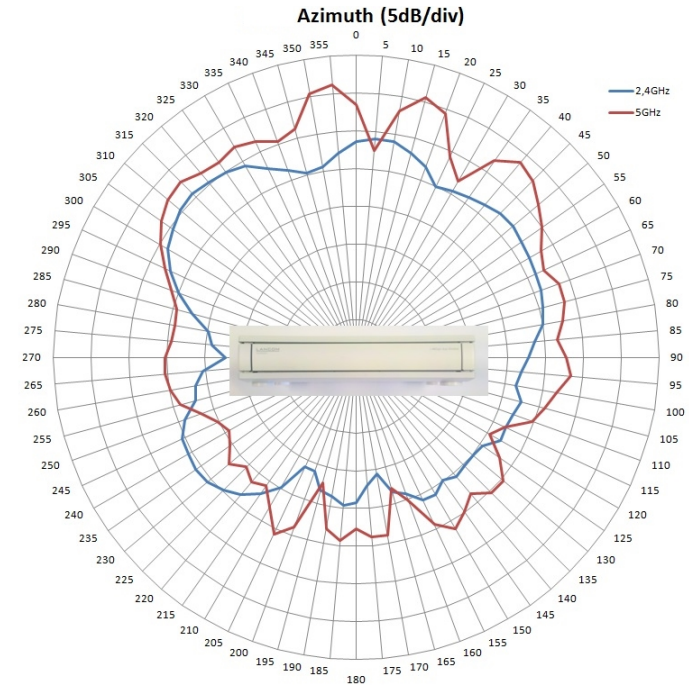
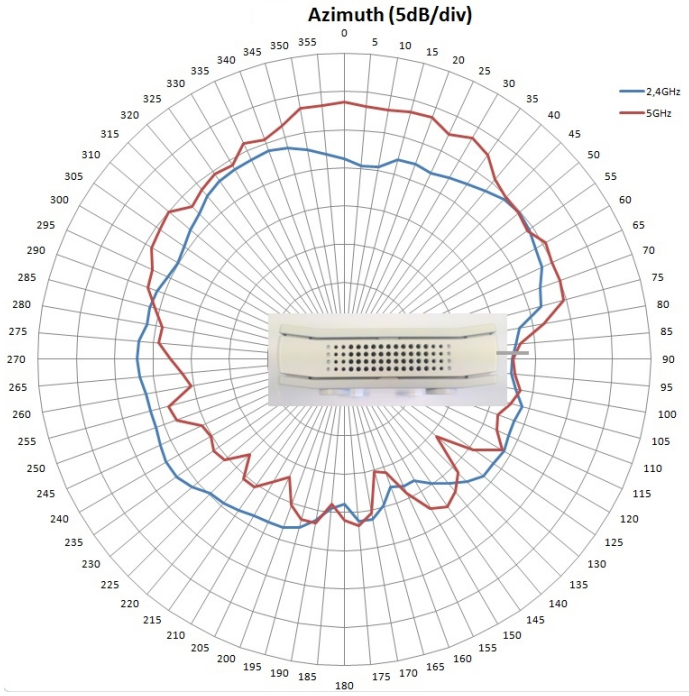
Features as of: LCOS 9.00

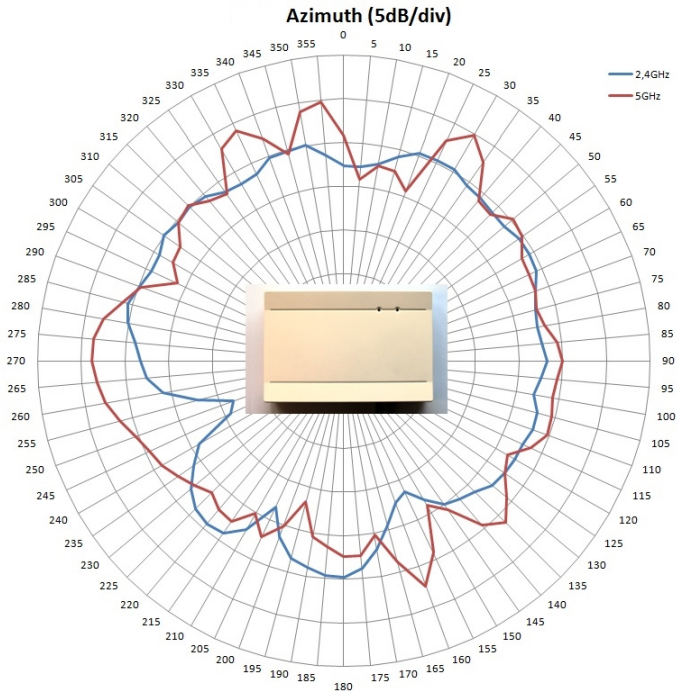
| | |
|---|---|
| **Management** | |
| TACACS+ | Support of TACACS+ protocol for authentication, authorization and accounting (AAA) with reliable connections and encrypted payload. Authentication and authorization are separated completely. LANCOM access rights are converted to TACACS+ levels. With TACACS+ access can be granted per parameter, path, command or functionality for LANconfig, WEBconfig or Telnet/SSH. Each access and all changes of configuration are logged. Access verification and logging of SNMP Get and Set requests. WEBconfig supports the access rights of TACACS+ and choice of TACACS+ server at login. LANconfig provides a device login with the TACACS+ request conveyed by the addressed device. Authorization to execute scripts and each command within them by checking the TACACS+ server's database. CRON, action-table and script processing can be diverted to avoid TACACS+ to relieve TACACS+ servers. Redundancy by setting several alternative TACACS+ servers. Configurable option to fall back to local user accounts in case of connection drops to the TACACS+ servers. Compatibility mode to support several free TACACS+ implementations |
| RADIUS | Support of RADIUS protocol for authentication of configuration access. Administrative privileges can be assigned for each administrator. |
| Remote maintenance of 3rd party devices | A remote configuration for devices behind der LANCOM can be accomplished (after authentication) via tunneling of arbitrary TCP-based protocols, e.g. for HTTP(S) remote maintenance of VoIP phones or printers of the LAN. Additionally, SSH and Telnet client allow to access other devices from a LANCOM device with an interface to the target subnet if the LANCOM device can be reached at its command line interface |
| TFTP & HTTP(S) client | For downloading firmware and configuration files from a TFTP, HTTP or HTTPS server with variable file names (wildcards for name, MAC/IP address, serial number), e.g. for roll-out management. Commands for live Telnet session, scripts or CRON jobs. HTTPS Client authentication possible by username and password or by certificate |
| SSH & Telnet client | SSH-client function compatible to Open SSH under Linux and Unix operating systems for accessing third-party components from a LANCOM router. Also usable when working with SSH to login to the LANCOM device. Support for certificate- and password-based authentication. Generates its own key with sshkeygen. SSH client functions are restricted to administrators with appropriate rights. Telnet client function to login/administer third party devices or other LANCOM devices from command line interface |
| HTTPS Server | Option to choose if an uploaded certificate or the default certificate is used by the HTTPS server |
| Security | Access rights (read/write) over WAN or (W)LAN can be set up separately (Telnet/SSL, SSH, SNMP, HTTPS/HTTP), access control list |
| Scripting | Scripting function for batch-programming of all command-line parameters and for transferring (partial) configurations, irrespective of software versions and device types, incl. test mode for parameter changes. Utilization of timed control (CRON) or connection establishment and termination to run scripts for automation. Scripts can send e-mails with various command line outputs as attachments |
| Load commands | LoadFirmware, LoadConfig and LoadScript can be executed conditionally in case certain requirements are met. For example, the command LoadFirmware could be executed on a daily basis and check each time if the current firmware is up to date or if a new version is available. In addition, LoadFile allows the upload of files including certificates and secured PKCS#12 containers |
| SNMP | SNMP management via SNMPv2, new unified private MIB for all most current and future LANCOM devices with LCOS. Download link in WEBconfig |
| Timed control | Scheduled control of parameters and actions with CRON service |
| Diagnosis | Extensive LOG and TRACE options, PING and TRACEROUTE for checking connections, LANmonitor status display, internal logging buffer for SYSLOG and firewall events |
| LANCOM WLAN controller | Supported by all LANCOM WLAN controller (separate optional hardware equipment for installation, optimization, operating and monitoring of WLAN networks, except for P2P connections) |
| **Statistics** | |
| Statistics | Extensive Ethernet, IP and DNS statistics; SYSLOG error counter |
| Accounting | Connection time, online time, transfer volumes per station. Snapshot function for regular read-out of values at the end of a billing period. Timed (CRON) command to reset all counters at once |
| Export | Accounting information exportable via LANmonitor and SYSLOG |
| **Hardware** | |
| Power supply | 12 V DC, external power adapter (230 V) with bayonet cap to protect against accidentally unplugging |
| Power supply | Via Power over Ethernet, compliant with IEEE 802.3af*/at |
| Environment | Temperature range 0–40°C a vertical mounting position using the LANCOM Wall Mount; Temperature range 0–35°C a horizontal mounting position; humidity 0–95%; non-condensing; In order to prevent overheating of the device the WLAN modules are deactivated automatically. |
| Mounting | Recommended mounting via LANCOM Wall Mount with the device's front facing downwards. |
| Housing | Robust synthetic housing, rear connectors, ready for wall mounting, Kensington lock; 210 x 45 x 140 mm (W x H x D) |
| Power consumption (max) | Approx. 18.9 W via 12V/1.5 A power adapter (value refers to the overall power for the access point and power adapter), about 16 W via PoE (value refers to the power for the access point only) |
| *) Note | It is recommended to use a PoE adapter or switch with IEEE 802.3at support. Using PoE with IEEE 802.3af the number of spatial streams is limited. |
| **Declarations of conformity*** | |
| CE | EN 60950-1, EN 301 489-1, EN 301 489-17 |

# LANCOM L-1310acn dual Wireless

Features as of: LCOS 9.00

| Declarations of conformity* | |
|---|---|
| 2.4 GHz WLAN | EN 300 328 |
| 5 GHz WLAN | EN 301 893 |
| Notifications | Certifications notified in Germany, Belgium, Netherlands, Luxembourg, Austria, Switzerland, UK, Italy, Spain, France, Portugal, Czech Republic, Denmark |
| IPv6 | IPv6 Ready Gold |
| *) Note | You will find all declarations of conformity in the products section of our website at www.lancom-systems.eu |
| **Scope of delivery** | |
| Manual | Hardware Quick Reference (EN, DE), Installation Guide (DE/EN/FR/ES/IT/PT/NL) |
| CD/DVD | Data medium with management software (LANconfig, LANmonitor, WLANmonitor, LANCAPI) and documentation |
| Cable | 1 Ethernet cable, 3 m |
| Power supply unit | External power adapter (230 V), NEST 12 V/1.5 A DC/S, coaxial power connector 2.1/5.5 mm bayonet, temperature range from -5 to +45° C, LANCOM item no. 110723 (EU)/LANCOM item no 110829 (UK) |
| **Support** | |
| Warranty | 3 years support via hotline and Internet KnowledgeBase |
| Software updates | Regular free updates (LCOS operating system and LANCOM Management System) via Internet |
| **Options** | |
| Advance Replacement | LANCOM Next Business Day Service Extension CPE, item no. 61411 |
| Warranty Extension | LANCOM 2-Year Warranty Extension CPE, item no. 61414 |
| Public Spot | LANCOM Public Spot Option (authentication and accounting software for hotspots, incl. Voucher printing through Standard PC printer), item no. 60642 |
| **Accessories** | |
| LANCOM Large Scale Monitor | Powerful monitoring system for WLAN, VPN, and LAN infrastructures of mid-sized to large networks, upgradable for up to 1000 monitored devices, for a proactive error management, browser-based remote monitoring, intuitive user interface, graphic floorplans, configurable triggers for alarms and messages, users, roles, and rights management, item no. 62910 |
| LANCOM WLC-4006+ (EU/UK/US) | LANCOM WLAN controller for central management of 6 (opt. up to 30) LANCOM access points and WLAN routers, item no. 62035 (EU), item no. 62036 (UK) and item no. 62037 (US) |
| LANCOM WLC-4006 (EU/UK) | LANCOM WLAN controller for central management of 6 or 12 LANCOM access points and WLAN routers, item no. 61367 (EU) and item no. 61368 (UK) - only stock devices, article is no longer available |
| LANCOM WLC-4025+ (EU/UK/US) | LANCOM WLAN controller for central management of 25 (opt. up to 100) LANCOM access points and WLAN routers, item no. 61378, item no. Art.-Nr. 61379 and item no. 61384 (US) |
| LANCOM WLC-4025 (EU/UK) | LANCOM WLAN controller for central management of 25 (opt. up to 100) LANCOM access points and WLAN routers, item no. 61550 (EU) and item no. 61551 (UK) - only stock devices, article is no longer available |
| LANCOM WLC-4100 (EU/UK) | LANCOM WLAN controller for central management of 100 (opt. up to 1000) LANCOM access points and WLAN routers, item no. 61369 (EU) and item no. 61377 (UK) |
| Surge arrestor (LAN cable) | AirLancer Extender SA-LAN surge arrestor (LAN cable), item no. 61213 |
| LANCOM Wall Mount | For simple, theft-proof mounting of LANCOM devices with plastic housings, item no. 61349 |
| LANCOM Wall Mount (White) | For simple, theft-proof mounting of LANCOM devices with plastic housings, item no. 61345 |
| Analog modem backup/serial adapter | LANCOM Serial Adapter Kit, item no. 61500 |
| **Item number(s)** | |
| LANCOM L-1310acn dual Wireless (EU/UK) | 61734(EU), 61735(UK) |

| Antenna Gain | |
|---|---|
| antenna pattern, front view |  |
| antenna pattern, side view |  |

| Antenna Gain | |
|---|---|
| antenna pattern, top view |  |



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